

Remarks

I. Status of claims

Claims 1-21 were pending.

Claims 7, 10, 11, and 13 have been canceled without prejudice.

Claims 1-6, 8, 9, 12, and 14-21 now are pending. The Examiner's rejections of canceled claims 7, 10, 11, and 13 will not be discussed below.

II. Claim rejections under 35 U.S.C. § 101

The claims have been amended in a way that addresses the Examiner's concerns under 35 U.S.C. § 101. The rejection of the claims under 35 U.S.C. § 101 now should be withdrawn.

III. Claim rejections under 35 U.S.C. § 112

The claims have been amended in a way that addresses the Examiner's concerns under 35 U.S.C. § 112, second paragraph. The rejection of the claims under 35 U.S.C. § 112, second paragraph, now should be withdrawn.

IV. Claim and specification notes

Claims 3-6 have been amended in a way that addresses the Examiner's concerns regarding the way in which these claims were defined.

In the following numbered paragraphs, the Examiner's inquiries regarding the specification are indicated by bold, italicized font and the responses to the Examiner's inquiries are indicated by normal font.

1. *What is $C_{safety}(q_{spot})$?*

$C_{safety}(q_{spot})$ is the cost of obtaining from non-spot-market sources an amount of the product equal to $q_{max} - q_{spot}$, expressed as a function of the amount (q_{spot}) of the product supplied from spot market sources (see, e.g., page 8, lines 8-27).

2. *The claims are drawn to planning a safety stock, but it appears that the safety stock and the cost thereof is already defined by the product cost of the non-spot market inventory. Is this a cost per item or actual total cost?*

The claims as amended are drawn to a method of computing an optimal safety stock level for a product to cover uncertainty in demand over an exposure period with a desired service level based at least in part on a cost of obtaining the product from one or more spot market sources. In accordance with the embodiments described in the specification, the optimal safety stock level ($q_{\text{safety, optimal}}$) is the amount of the product obtained from non-spot-market sources. The maximum safety stock level (q_{max}) is the amount of safety stock that covers uncertainty in demand over an exposure period with a desired service level when the product is supplied solely from non-spot-market sources. As explained in section II (pages 8-12) and shown in FIG. 5, the optimal safety stock level ($q_{\text{safety, optimal}}$) from non-spot-market sources is equal to the maximum safety stock level minus the amount ($q_{\text{spot, optimal}}$) of product obtained from spot market sources. The calculation of these parameters is explained below in the response that follows paragraph 4.

The "product cost" is the per-unit cost of obtaining the product from a source (see, e.g., page 10, lines 12-14).

3. *Please define the terms in figure 5 more clearly.*

The parameter q_{max} is the amount of safety stock that covers uncertainty in demand over an exposure period with a desired service level when the product is supplied solely from non-spot-market sources.

The parameter q_{spot} is the optimal amount of product obtained from spot market sources that minimizes the total cost of covering uncertainty in demand over an exposure period with a desired service level.

The parameter $q_{\text{safety, optimal}}$ is the optimal amount of product obtained from non-spot-market sources that minimizes the total cost of covering uncertainty in demand over an exposure period with a desired service level. This parameter is equal to the maximum safety stock level (q_{max}) minus the optimal amount of the product from spot market sources ($q_{\text{spot, optimal}}$) that minimizes the total cost (see page 10, line 21).

$C_{\text{safety}}(q_{\text{spot}})$ is the cost of obtaining the product from non-spot-market sources expressed as a function of the amount of the product supplied from spot market sources (q_{spot}) (see, e.g., page 8, lines 14-16).

$C_{\text{spot}}(q_{\text{spot}})$ is the cost of obtaining the product from spot-market sources expressed as a function of the amount of the product supplied from spot market sources (q_{spot}) (see, e.g., page 8, lines 14-16).

$C_{\text{total}}(q_{\text{spot}})$ is the total cost of obtaining the product from spot market sources and non-spot-market sources expressed as a function of the amount of the product supplied from spot market sources (q_{spot}) (see, e.g., page 10, line 17).

- 4. In the proposed claim, it recites “computing a safety stock level ...” It does not appear that the disclosure computes a “safety stock level”, but does compute an amount a safety stock level could be reduced. The initial safety stock level is predetermined and guessed or estimated, but not calculated. Therefore, a final or reduced safety stock level cannot be calculated either.**

As explained in section II (pages 8-12), the maximum safety stock level (q_{max}) corresponds to the amount of safety stock that covers uncertainty in demand over an exposure period with a desired service level when the product is supplied solely from non-spot-market sources. In one embodiment, the maximum safety stock level is computed in accordance with equation (1) on page 9 of the specification:

$$q_{\text{MAX}} = \Phi^{-1}(\alpha) \times [\mu_D^2 \cdot \sigma_L^2 + (\mu_L + R) \cdot \sigma_D^2]^{1/2} \quad (1)$$

where $\Phi^{-1}(z)$ is the standard normal inverse function, α is the service level specified as the probability of meeting all demand in the review period, μ_D is the estimated mean demand, σ_L is the estimated lead time standard deviation, μ_L is the estimated mean lead time, σ_D is the estimated demand standard deviation, and R is the review period. Note that cost is not an input into the standard approach for calculating the safety stock level that is defined in equation (1).

The parameter $q_{\text{safety, optimal}}$ is computed by incrementally reducing the maximum safety stock level (see page 9, lines 15-16). The amount of product obtained from spot market sources ($q_{\text{spot, optimal}}$) that minimizes the total cost is computed in accordance with equation (2) (see page 9, lines 24-25)

- 5. The specification uses the terms “product cost” and “cost of obtaining product”. are these the same terms? Or is the “cost of obtaining product” the administrative and holding cost, which does not include the price of the product.**

The terms “product cost” and “cost of obtaining product” both refer to the per-unit cost of obtaining the product from a source (see, e.g., page 10, lines 12-13). These terms may

include fees and other costs associated with obtaining the product (see page 10, lines 14-16). The administrative and holding costs are incorporated in the annual inventory-driven cost percentage parameter (I_{safety}) (see page 10, lines 13-14).

V. Claim rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1-6, 8, 9, 12, and 14-21 under 35 U.S.C. § 103(a) over Brinkley (U.S. 5,963,919) in view of Salvo (U.S. 6,341,271).

A. Independent claim 1

Independent claim 1 has been amended and now recites:

1. A machine-implemented inventory planning method, comprising computing an optimal safety stock level for a product to cover uncertainty in demand over an exposure period with a desired service level based at least in part on a cost of obtaining the product from one or more spot market sources.

Neither Brinkley nor Salvo teaches or suggests “computing an optimal safety stock level for a product to cover uncertainty in demand over an exposure period with a desired service level based at least in part on a cost of obtaining the product from one or more spot market sources,” as now recited in claim 1.

1. Brinkley

Brinkley describes an inventory management system (MISER program 250) that selects one of multiple possible inventory strategies for an inventory item (see, e.g., Summary of the Invention).

After a portfolio of inventory items having the format shown in FIG. 4 is input into the system, the system “stratifies the portfolio based on three criteria: order cost, volume of orders, and number of orders” (col. 9, lines 1-3). “The goal of stratification is to identify the cutoff values used in the various nodes of the decision tree” that is used to select the appropriate inventory strategy (col. 8, lines 47-52). The “cost per order” is the first

stratification criteria and is used to identify items that are "high risk" on an order-by-order basis (see col. 9, lines 10-11).

The unit cost input shown in FIG. 4 is used only in the above-described process of determining which inventory strategy to use for a particular inventory item; it is not used to compute a safety stock level for the inventory item. In particular, "Once MISER program 250 determines the recommended optimal inventory strategy for each portfolio item, it calculates additional values necessary to implement the recommended strategy" (col. 12, lines 44-47). These calculations are described at col. 12, line 50, through col. 14, line 13. This detailed description clearly shows that safety stock is computed only for inventory strategies 3, 5, 6; safety stock is always zero for each of the other inventory strategies 1, 2, 4. In each inventory strategy where safety stock is computed, it is computed in the same way: $SS = k(\sigma_{\text{demand}} \sqrt{L})$, where k corresponds to the desired service level, σ_{demand} is the standard deviation of demand per period, and L is the procurement lead time.

Thus, in accordance with Brinkley's teachings, the safety stock level is computed based solely on the desired service level, the standard deviation of demand per period, and the procurement lead time; the safety stock level is not computed based at least in part on a cost of obtaining the product from one or more spot market sources. Indeed, in Brinkley's approach, the cost of an inventory item is not a factor in the computation of the safety stock level for the inventory item.

2. Salvo

Salvo's inventory management system implements two separate functions: (1) monitoring and determining real-time inventory status; and (2) purchasing inventory at a lowest possible price. (See col. 3, lines 41-62).

Control unit 114 first determines if an inventory order is needed based on amount signals received from each on-site storage device (see col. 5, lines 1-10). Next, the control unit 114 uses signals received from inventory price source 126 to determine a lowest total inventory purchase price vendor (low price vendor) for the inventory. (See col. 6, lines 7-9 and 47-52).

Therefore, in accordance with Salvo's teaching, the price source module 126 is used only to "to determine the lowest available price for the inventory" (col. 6, lines 7-9). The

price source module 126 is not used to supply an input into a safety stock calculation engine or the like.

3. Combining Brinkley and Salvo

The Examiner has suggested that "it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify Brinkley et al. system to incorporate the inventory price source module of Salvo et al as a source for many set of input values in the Brinkley et al. process which plans safety stock levels in order to optimize purchase value." As explained above, however, in accordance with Brinkley's teachings, product cost is not an input for the safety stock calculations that are made by Brinkley's MISER program.

The combination of Brinkley and Salvo that is most consistent with the teachings of both references is to use Salvo's price source module to determine the low price vendor AFTER a decision to order an amount of an inventory item has been made by Brinkley's system. That is, Salvo's price source module would not be used to supply an input value into Brinkley's inventory management system. It is conceivable that Salvo's price source module might be used to determine the unit cost input value for an inventory item (see FIG. 4). As explained above, however, the unit cost value is used only in the process of identifying the optimal inventory strategy for an inventory item; it is not used to compute a safety stock level for the inventory item, as recited in amended claim 1.

4. Conclusion

Neither Brinkley nor Salvo teaches or suggests "computing an optimal safety stock level for a product to cover uncertainty in demand over an exposure period with a desired service level based at least in part on a cost of obtaining the product from one or more spot market sources." Accordingly, there is no possible combination of Brinkley and Salvo that could have led one of ordinary skill in the art at the time of the invention to perform the machine-implemented inventory planning method now recited in claim 1.

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B. Claims 2-6, 8, 9, 12, and 14-21

Each of claims 2-6, 8, 9, 12, and 14-21 incorporates the features of independent claim 1 and therefore is patentable over Brinkley and Salvo for at least the same reasons explained above.

VI. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

Respectfully submitted,

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